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Our Ref: 2907/K.Z

6 January 2017

Xiamen New Way Energy Technology Co. Ltd.  
Room 402, 21 Wanghai Road, Software Park 2  
Siming District, Xiamen 361008  
China

### **PV Array Frame Engineering Certification**

#### **Installation of New Way Energy Tilt Mount Solar System on KlipLok 406 Roof**

Gamcorp (Melbourne) Pty Ltd, being Structural Engineers within the meaning of Australian Building Regulations, have carried out a structural design check of New Way Energy Tilt Mount Solar System installation on KlipLok 406 roof within Australia. The design check has been based on the information, test report and schematic drawings of the system components provided by Xiamen New Way Energy Tech Co. Ltd.

We find the Installation of New Way Energy Roof Tilt Mount Solar System for Australian use to be structurally sufficient based on the following conditions:

- Wind loads to AS/NZ1170.2:2011 Admt 3:2013
- Wind region A, B, C, D
- Wind terrain category 2 & 3
- Wind average recurrence interval of 500 years
- Maximum building height 20m
- Maximum PV panel dimensions to be 2000mm x 1000mm
- Maximum weight of the PV panel and array frame to be 15 kg/m<sup>2</sup>
- Rails to be ATL-TYN-28, ATL-TYN-53 and CG-010
- The roof interface to be New Way Energy tilt leg ATL-TYN-56 on Klamp Lock 406 clips
- Roof sheeting to be Lysaght KlipLok 406 with minimum BMT of 0.42mm
- Capacity of Klamp Lock 406 clips is from the test report no.MT-15/317
- Each PV panel to be installed using 2 rails minimum in all circumstances
- Installation of PV array to be done in accordance with the PV installation manual
- The certification **excludes** assessment of roof structure and PV panels

***Refer to attached summary table for interface spacing***

#### **NOTES:**

- **The recommended spacing nominated in this certification is based on the capacity of the array frame, not the roof structure and PV panel. It is the responsibility of the installer to adopt the most critical spacing.**

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- **If any of the above conditions cannot be met, the structural engineer must be notified immediately.**

Construction is to be carried out strictly in accordance with the manufacturers instructions. This work was designed in accordance with the provisions of Australian Building Regulations and in accordance with sound, widely accepted engineering principles.

Yours faithfully,  
Gamcorp (Melbourne) Pty Ltd



Martin Gamble  
Managing Director  
MAICD



Mudi Ariyaratna  
B.Eng(Civil)(Hons)Monash, M.Eng&Mgt, MIEAust,  
CPEng, NPER, RBP EC-39699, RPEQ- 15899

## Structural Design Documentation

**Adjustable Tilt Leg PV Racking System  
KlipLok 406 Interface Spacing Table  
According to AS/NZS 1170.2-2011 Amdt 3-2013  
with ATL-TYN-28 Rails  
within Australia  
Terrain Category 2 & 3**

For: Xiamen New Way Energy  
Technology Co. Ltd.



Job Number: 2907  
Date: 6 January 2017

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Certificate No: AU1222

**Job No: 2907**

**Client: Xiamen New Way Energy Technology Co. Ltd.**

**Project: Tilt Leg with KlipLok 406 Interface Spacing Table**

**Address: within Australia**

**Australian Standards**

AS/NZS 1170. 2011 – Structural Design Actions

Part 0 – General Principles

Part 1 – Permanent imposed and other actions

Part 2 – Wind Actions

AS/NZS 1252 – High Strength Structural Bolting

AS 4055 – Wind Loads for Housing

AS/NZS 1664 – Aluminium Structures

AS 4100 – Steel Structures

AS/NZS 4600 – Cold-Formed Steel Structures

**Wind Terrain Category:**

WTC 2 & 3

**Designed: K.Z**

**Date: Jan-17**

Client: **Xiamen New Way Energy Technology Co. Ltd.**  
 Project: **Tilt Leg with KlipLok 406 Interface Spacing Table**  
 Address: **within Australia**  
 Designed: **K.Z**

Job: **2907**  
 Date: **Jan-17**

Checked: **M.A**

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail ATL-TYN-28  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 2**

Tilt Angle from Horizontal  $10^\circ < \Phi \leq 15^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	820	1256	1653	1860	675	1029	1395	1759	610	929	1258	1710	576	876	1185	1682
B	504	765	1033	1590	415	629	848	1299	376	569	766	1171	355	537	723	1103
C	338	511	687	1049	279	422	566	861	253	382	512	778	228	345	462	702
D	208	314	421	638	172	259	347	525	156	235	315	475	141	212	284	429

Tilt Angle from Horizontal  $15^\circ < \Phi < 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	448	679	916	1405	369	559	752	1150	334	506	680	1037	316	477	642	978
B	277	418	561	853	229	345	462	702	207	312	419	634	196	295	395	599
C	186	281	376	570	154	232	311	469	140	210	281	425	126	190	254	384
D	115	173	232	350	95	143	191	289	86	130	174	261	78	117	157	236

Tilt Angle from Horizontal  $\Phi = 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	365	552	743	1135	301	455	611	931	273	412	553	841	258	389	522	793
B	226	341	457	693	187	281	377	571	169	255	341	516	160	241	322	487
C	152	229	307	464	126	189	253	382	114	172	230	346	103	155	207	313
D	94	142	189	285	78	117	156	236	71	106	142	213	64	96	128	193

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail ATL-TYN-28  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 2**

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	286	431	579	881	236	356	477	725	214	322	432	655	202	304	408	618
B	177	267	357	541	146	220	295	446	133	200	267	403	125	189	252	381
C	119	180	240	363	99	149	199	299	90	135	180	271	81	122	163	245
D	74	111	148	223	61	92	123	185	55	83	111	167	50	75	101	151

Tilt Angle from Horizontal  $20^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $11^\circ - 20^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	349	528	710	1083	288	435	584	889	261	394	528	803	246	372	499	757
B	216	326	437	662	178	269	360	545	162	244	326	493	153	230	308	466
C	146	219	293	443	120	181	242	366	109	164	219	331	99	148	198	299
D	90	135	181	273	75	112	150	225	68	102	136	204	61	92	122	184

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $21^\circ - 30^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	579	881	1192	1685	477	725	978	1503	432	655	883	1354	408	618	832	1275
B	357	541	727	1111	295	446	598	911	267	403	541	823	252	381	511	776
C	240	363	486	738	199	299	401	608	180	271	363	550	163	245	328	496
D	148	223	299	452	123	185	247	373	111	167	224	337	101	151	202	305

Client: **Xiamen New Way Energy Technology Co. Ltd.**  
 Project: **Tilt Leg with KlipLok 406 Interface Spacing Table**  
 Address: **within Australia**  
 Designed: **K.Z**

Job: **2907**  
 Date: **Jan-17**

Checked: **M.A**

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail ATL-TYN-28  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 3**

Tilt Angle from Horizontal  $10^\circ < \Phi \leq 15^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	994	1529	1742	1968	994	1529	1742	1968	859	1317	1674	1885	767	1172	1594	1824
B	608	926	1254	1905	608	926	1254	1905	527	801	1082	1668	471	715	965	1482
C	408	618	832	1274	408	618	832	1274	354	535	720	1099	303	457	615	937
D	251	379	508	772	251	379	508	772	218	329	440	668	187	281	377	571

Tilt Angle from Horizontal  $15^\circ < \Phi < 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	541	822	1111	1653	541	822	1111	1653	469	711	959	1473	419	635	856	1311
B	334	504	678	1035	334	504	678	1035	289	437	587	894	259	391	525	798
C	224	339	454	689	224	339	454	689	195	294	394	596	167	252	337	510
D	139	209	279	422	139	209	279	422	120	181	242	366	103	155	208	313

Tilt Angle from Horizontal  $\Phi = 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	440	667	900	1380	440	667	900	1380	382	578	778	1190	342	517	695	1060
B	272	411	552	839	272	411	552	839	236	356	478	726	212	319	428	648
C	183	276	370	560	183	276	370	560	159	240	321	485	136	205	275	415
D	113	170	228	344	113	170	228	344	98	148	198	298	84	127	169	255

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail ATL-TYN-28  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 3**

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	344	521	700	1069	344	521	700	1069	299	451	606	923	267	404	542	824
B	213	321	431	653	213	321	431	653	185	279	374	566	166	250	334	506
C	144	216	290	437	144	216	290	437	125	188	251	379	107	161	215	325
D	89	134	179	269	89	134	179	269	77	116	155	234	66	99	133	200

Tilt Angle from Horizontal  $20^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $11^\circ - 20^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	541	822	1111	1316	541	822	1111	1316	469	711	959	1135	419	635	856	1012
B	334	504	678	801	334	504	678	801	289	437	587	693	259	391	525	619
C	224	339	454	535	224	339	454	535	195	294	394	464	167	252	337	397
D	139	209	279	328	139	209	279	328	120	181	242	285	103	155	208	244

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $21^\circ - 30^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	994	1529	1742	1777	994	1529	1742	1777	859	1317	1674	1707	767	1172	1594	1655
B	608	926	1254	1350	608	926	1254	1350	527	801	1082	1164	471	715	965	1037
C	408	618	832	894	408	618	832	894	354	535	720	773	303	457	615	660
D	251	379	508	545	251	379	508	545	218	329	440	473	187	281	377	404



**General Notes**

Note 1 Following components are satisfied to use according to AS/NZS 1170.2 - 2011 Amdt 3 - 2013

Components	Part Number	Description
Standard Rail	ATL-TYN-28	Antai Rail II
Light Rail	ATL-TYN-53	Antai Rail III
Light Rail 2	CG-010	Antai CG-010 Light Rail
Inter Clamp	ATL-FWNY-09	Internal fixing between rail and Solar Panel
End Clamp	ALT-TYN-14	End fixing between rail and Solar Panel
Adjustable Tilt Leg	ATL-TYN-57	Adjustable back legs
Rail Splice	ATL-TYN-21	Rail Connection
Klamp Lock 406 Clip		Capacity from test report No.MT-15/317

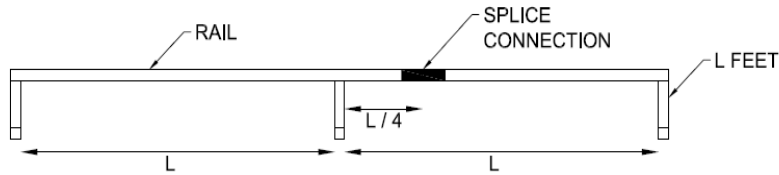
Note 2 Refer attached Gamcorp Roof Definition and Figure 5.3 of AS/NZS 1170.2:2011 for definition of roof zones

Note 3 Terrain Category 2 (TC2) refers to open terrain, including grassland, with well-scattered obstructions having heights generally from 1.5 m to 5 m, with no more than two obstruction per obstructions per hectare.

Terrain Category 3 (TC3) refers to numerous closely spaced obstructions having heights generally from 3m to 10m. For example, suburban housing or light industrial estates. Refer clause 4.2.1 of AS/NZS 1170.2-2011 Amdt 3-2013 for definition of Terrain Category 3.

Note 4 Above tables apply when the roof sheeting is **Lysaght Kliplok 406** with minimum 0.42 BMT.

Note 5 Splice connection must placed quarter length of the spacing of the L foot. No Splice connection should be placed at the centre of spacing or over the L foot.



## Structural Design Documentation

**Adjustable Tilt Leg PV Racking System  
KlipLok 406 Interface Spacing Table  
According to AS/NZS 1170.2-2011 Amdt 3-2013  
with ATL-TYN-53 Rails  
within Australia  
Terrain Category 2 & 3**

For: Xiamen New Way Energy  
Technology Co. Ltd.



Job Number: 2907  
Date: 6 January 2017

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**Job No: 2907**

**Client: Xiamen New Way Energy Technology Co. Ltd.**

**Project: Tilt Leg with KlipLok 406 Interface Spacing Table**

**Address: within Australia**

**Australian Standards**

AS/NZS 1170. 2011 – Structural Design Actions

Part 0 – General Principles

Part 1 – Permanent imposed and other actions

Part 2 – Wind Actions

AS/NZS 1252 – High Strength Structural Bolting

AS 4055 – Wind Loads for Housing

AS/NZS 1664 – Aluminium Structures

AS 4100 – Steel Structures

AS/NZS 4600 – Cold-Formed Steel Structures

**Wind Terrain Category:**

WTC 2 & 3

**Designed: K.Z**

**Date: Jan-17**

Client: **Xiamen New Way Energy Technology Co. Ltd.**  
 Project: **Tilt Leg with KlipLok 406 Interface Spacing Table**  
 Address: **within Australia**  
 Designed: **K.Z**

Job: **2907**  
 Date: **Jan-17**

Checked: **M.A**

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail ATL-TYN-53  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 2**

Tilt Angle from Horizontal  $10^\circ < \Phi \leq 15^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	820	1256	1618	1821	675	1029	1395	1722	610	929	1258	1674	576	876	1185	1647
B	504	765	1033	1590	415	629	848	1299	376	569	766	1171	355	537	723	1103
C	338	511	687	1049	279	422	566	861	253	382	512	778	228	345	462	702
D	208	314	421	638	172	259	347	525	156	235	315	475	141	212	284	429

Tilt Angle from Horizontal  $15^\circ < \Phi < 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	448	679	916	1405	369	559	752	1150	334	506	680	1037	316	477	642	978
B	277	418	561	853	229	345	462	702	207	312	419	634	196	295	395	599
C	186	281	376	570	154	232	311	469	140	210	281	425	126	190	254	384
D	115	173	232	350	95	143	191	289	86	130	174	261	78	117	157	236

Tilt Angle from Horizontal  $\Phi = 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	365	552	743	1135	301	455	611	931	273	412	553	841	258	389	522	793
B	226	341	457	693	187	281	377	571	169	255	341	516	160	241	322	487
C	152	229	307	464	126	189	253	382	114	172	230	346	103	155	207	313
D	94	142	189	285	78	117	156	236	71	106	142	213	64	96	128	193

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail ATL-TYN-53  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 2**

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	286	431	579	881	236	356	477	725	214	322	432	655	202	304	408	618
B	177	267	357	541	146	220	295	446	133	200	267	403	125	189	252	381
C	119	180	240	363	99	149	199	299	90	135	180	271	81	122	163	245
D	74	111	148	223	61	92	123	185	55	83	111	167	50	75	101	151

Tilt Angle from Horizontal  $20^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $11^\circ - 20^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	349	528	710	1083	288	435	584	889	261	394	528	803	246	372	499	757
B	216	326	437	662	178	269	360	545	162	244	326	493	153	230	308	466
C	146	219	293	443	120	181	242	366	109	164	219	331	99	148	198	299
D	90	135	181	273	75	112	150	225	68	102	136	204	61	92	122	184

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $21^\circ - 30^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	579	881	1192	1650	477	725	978	1503	432	655	883	1354	408	618	832	1275
B	357	541	727	1111	295	446	598	911	267	403	541	823	252	381	511	776
C	240	363	486	738	199	299	401	608	180	271	363	550	163	245	328	496
D	148	223	299	452	123	185	247	373	111	167	224	337	101	151	202	305

Client: **Xiamen New Way Energy Technology Co. Ltd.**  
 Project: **Tilt Leg with KlipLok 406 Interface Spacing Table**  
 Address: **within Australia**  
 Designed: **K.Z**

Job: **2907**  
 Date: **Jan-17**

Checked: **M.A**

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail ATL-TYN-53  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 3**

Tilt Angle from Horizontal  $10^\circ < \Phi \leq 15^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	994	1529	1706	1928	994	1529	1706	1928	859	1317	1639	1846	767	1172	1589	1786
B	608	926	1254	1865	608	926	1254	1865	527	801	1082	1668	471	715	965	1482
C	408	618	832	1274	408	618	832	1274	354	535	720	1099	303	457	615	937
D	251	379	508	772	251	379	508	772	218	329	440	668	187	281	377	571

Tilt Angle from Horizontal  $15^\circ < \Phi < 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	541	822	1111	1619	541	822	1111	1619	469	711	959	1473	419	635	856	1311
B	334	504	678	1035	334	504	678	1035	289	437	587	894	259	391	525	798
C	224	339	454	689	224	339	454	689	195	294	394	596	167	252	337	510
D	139	209	279	422	139	209	279	422	120	181	242	366	103	155	208	313

Tilt Angle from Horizontal  $\Phi = 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	440	667	900	1380	440	667	900	1380	382	578	778	1190	342	517	695	1060
B	272	411	552	839	272	411	552	839	236	356	478	726	212	319	428	648
C	183	276	370	560	183	276	370	560	159	240	321	485	136	205	275	415
D	113	170	228	344	113	170	228	344	98	148	198	298	84	127	169	255

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail ATL-TYN-53  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 3**

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	344	521	700	1069	344	521	700	1069	299	451	606	923	267	404	542	824
B	213	321	431	653	213	321	431	653	185	279	374	566	166	250	334	506
C	144	216	290	437	144	216	290	437	125	188	251	379	107	161	215	325
D	89	134	179	269	89	134	179	269	77	116	155	234	66	99	133	200

Tilt Angle from Horizontal  $20^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $11^\circ - 20^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	541	822	1111	1316	541	822	1111	1316	469	711	959	1135	419	635	856	1012
B	334	504	678	801	334	504	678	801	289	437	587	693	259	391	525	619
C	224	339	454	535	224	339	454	535	195	294	394	464	167	252	337	397
D	139	209	279	328	139	209	279	328	120	181	242	285	103	155	208	244

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $21^\circ - 30^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	994	1529	1706	1740	994	1529	1706	1740	859	1317	1639	1671	767	1172	1589	1620
B	608	926	1254	1350	608	926	1254	1350	527	801	1082	1164	471	715	965	1037
C	408	618	832	894	408	618	832	894	354	535	720	773	303	457	615	660
D	251	379	508	545	251	379	508	545	218	329	440	473	187	281	377	404

**General Notes**

Note 1 Following components are satisfied to use according to AS/NZS 1170.2 - 2011 Amdt 3 - 2013

Components	Part Number	Description
Standard Rail	ATL-TYN-28	Antai Rail II
Light Rail	ATL-TYN-53	Antai Rail III
Light Rail 2	CG-010	Antai CG-010 Light Rail
Inter Clamp	ATL-FWNY-09	Internal fixing between rail and Solar Panel
End Clamp	ALT-TYN-14	End fixing between rail and Solar Panel
Adjustable Tilt Leg	ATL-TYN-57	Adjustable back legs
Rail Splice	ATL-TYN-21	Rail Connection
Klamp Lock 406 Clip		Capacity from test report No.MT-15/317

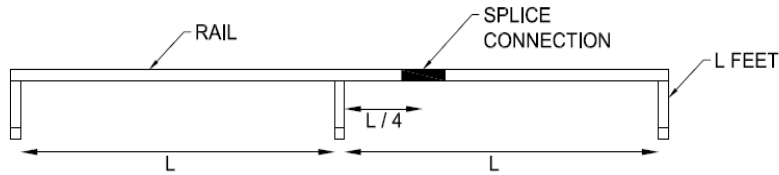
Note 2 Refer attached Gamcorp Roof Definition and Figure 5.3 of AS/NZS 1170.2:2011 for definition of roof zones

Note 3 Terrain Category 2 (TC2) refers to open terrain, including grassland, with well-scattered obstructions having heights generally from 1.5 m to 5 m, with no more than two obstruction per obstructions per hectare.

Terrain Category 3 (TC3) refers to numerous closely spaced obstructions having heights generally from 3m to 10m. For example, suburban housing or light industrial estates. Refer clause 4.2.1 of AS/NZS 1170.2-2011 Amdt 3-2013 for definition of Terrain Category 3.

Note 4 Above tables apply when the roof sheeting is **Lysaght Kliplok 406** with minimum 0.42 BMT.

Note 5 Splice connection must placed quarter length of the spacing of the L foot. No Splice connection should be placed at the centre of spacing or over the L foot.





## Structural Design Documentation

**Adjustable Tilt Leg PV Racking System  
KlipLok 406 Interface Spacing Table  
According to AS/NZS 1170.2-2011 Amdt 3-2013  
with CG-010 Rails  
within Australia  
Terrain Category 2 & 3**

For: Xiamen New Way Energy  
Technology Co. Ltd.



Job Number: 2907  
Date: 6 January 2017

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Certificate No: AU1222

**Job No: 2907**

**Client: Xiamen New Way Energy Technology Co. Ltd.**

**Project: Tilt Leg with KlipLok 406 Interface Spacing Table**

**Address: within Australia**

**Australian Standards**

AS/NZS 1170. 2011 – Structural Design Actions

Part 0 – General Principles

Part 1 – Permanent imposed and other actions

Part 2 – Wind Actions

AS/NZS 1252 – High Strength Structural Bolting

AS 4055 – Wind Loads for Housing

AS/NZS 1664 – Aluminium Structures

AS 4100 – Steel Structures

AS/NZS 4600 – Cold-Formed Steel Structures

**Wind Terrain Category:**

WTC 2 & 3

**Designed: K.Z**

**Date: Jan-17**

Client: **Xiamen New Way Energy Technology Co. Ltd.**  
 Project: **Tilt Leg with KlipLok 406 Interface Spacing Table**  
 Address: **within Australia**  
 Designed: **K.Z**

Job: **2907**  
 Date: **Jan-17**

Checked: **M.A**

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail CG-010  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 2**

Tilt Angle from Horizontal  $10^\circ < \Phi \leq 15^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	820	1256	1385	1558	675	1029	1314	1474	610	929	1258	1433	576	876	1185	1410
B	504	765	1033	1510	415	629	848	1299	376	569	766	1171	355	537	723	1103
C	338	511	687	1049	279	422	566	861	253	382	512	778	228	345	462	702
D	208	314	421	638	172	259	347	525	156	235	315	475	141	212	284	429

Tilt Angle from Horizontal  $15^\circ < \Phi < 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	448	679	916	1316	369	559	752	1150	334	506	680	1037	316	477	642	978
B	277	418	561	853	229	345	462	702	207	312	419	634	196	295	395	599
C	186	281	376	570	154	232	311	469	140	210	281	425	126	190	254	384
D	115	173	232	350	95	143	191	289	86	130	174	261	78	117	157	236

Tilt Angle from Horizontal  $\Phi = 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	365	552	743	1135	301	455	611	931	273	412	553	841	258	389	522	793
B	226	341	457	693	187	281	377	571	169	255	341	516	160	241	322	487
C	152	229	307	464	126	189	253	382	114	172	230	346	103	155	207	313
D	94	142	189	285	78	117	156	236	71	106	142	213	64	96	128	193

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail CG-010  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 2**

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	286	431	579	881	236	356	477	725	214	322	432	655	202	304	408	618
B	177	267	357	541	146	220	295	446	133	200	267	403	125	189	252	381
C	119	180	240	363	99	149	199	299	90	135	180	271	81	122	163	245
D	74	111	148	223	61	92	123	185	55	83	111	167	50	75	101	151

Tilt Angle from Horizontal  $20^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $11^\circ - 20^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	349	528	710	1083	288	435	584	889	261	394	528	803	246	372	499	757
B	216	326	437	662	178	269	360	545	162	244	326	493	153	230	308	466
C	146	219	293	443	120	181	242	366	109	164	219	331	99	148	198	299
D	90	135	181	273	75	112	150	225	68	102	136	204	61	92	122	184

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $21^\circ - 30^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	579	881	1192	1412	477	725	978	1339	432	655	883	1303	408	618	832	1275
B	357	541	727	1111	295	446	598	911	267	403	541	823	252	381	511	776
C	240	363	486	738	199	299	401	608	180	271	363	550	163	245	328	496
D	148	223	299	452	123	185	247	373	111	167	224	337	101	151	202	305

Client: **Xiamen New Way Energy Technology Co. Ltd.**  
 Project: **Tilt Leg with KlipLok 406 Interface Spacing Table**  
 Address: **within Australia**  
 Designed: **K.Z**

Job: **2907**  
 Date: **Jan-17**

Checked: **M.A**

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail CG-010  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 3**

Tilt Angle from Horizontal  $10^\circ < \Phi \leq 15^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	994	1345	1460	1649	994	1345	1460	1649	859	1294	1402	1580	767	1172	1360	1528
B	608	926	1254	1596	608	926	1254	1596	527	801	1082	1530	471	715	965	1482
C	408	618	832	1274	408	618	832	1274	354	535	720	1099	303	457	615	937
D	251	379	508	772	251	379	508	772	218	329	440	668	187	281	377	571

Tilt Angle from Horizontal  $15^\circ < \Phi < 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	541	822	1111	1385	541	822	1111	1385	469	711	959	1332	419	635	856	1293
B	334	504	678	1035	334	504	678	1035	289	437	587	894	259	391	525	798
C	224	339	454	689	224	339	454	689	195	294	394	596	167	252	337	510
D	139	209	279	422	139	209	279	422	120	181	242	366	103	155	208	313

Tilt Angle from Horizontal  $\Phi = 30^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	440	667	900	1310	440	667	900	1310	382	578	778	1190	342	517	695	1060
B	272	411	552	839	272	411	552	839	236	356	478	726	212	319	428	648
C	183	276	370	560	183	276	370	560	159	240	321	485	136	205	275	415
D	113	170	228	344	113	170	228	344	98	148	198	298	84	127	169	255

**Tilt Leg with KlipLok 406 Interface Spacing Table**

Type of Rail CG-010  
 Type of Interface Klamp Lock 406 Clip  
 Solar Panel Dimension 2m x 1m  
**Terrain category 3**

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $\leq 10^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	344	521	700	1069	344	521	700	1069	299	451	606	923	267	404	542	824
B	213	321	431	653	213	321	431	653	185	279	374	566	166	250	334	506
C	144	216	290	437	144	216	290	437	125	188	251	379	107	161	215	325
D	89	134	179	269	89	134	179	269	77	116	155	234	66	99	133	200

Tilt Angle from Horizontal  $20^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $11^\circ - 20^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	541	822	1111	1294	541	822	1111	1294	469	711	959	1135	419	635	856	1012
B	334	504	678	801	334	504	678	801	289	437	587	693	259	391	525	619
C	224	339	454	535	224	339	454	535	195	294	394	464	167	252	337	397
D	139	209	279	328	139	209	279	328	120	181	242	285	103	155	208	244

Tilt Angle from Horizontal  $30^\circ < \Phi \leq 45^\circ$   
 Roof Angle -  $21^\circ - 30^\circ$

Wind Region	Building Height - H (m)															
	H≤5				5<H≤10				10<H≤15				15<H≤20			
	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal	Corner	Edge	Intermediate	Internal
A	994	1345	1460	1489	994	1345	1460	1489	859	1294	1402	1430	767	1172	1360	1386
B	608	926	1254	1350	608	926	1254	1350	527	801	1082	1164	471	715	965	1037
C	408	618	832	894	408	618	832	894	354	535	720	773	303	457	615	660
D	251	379	508	545	251	379	508	545	218	329	440	473	187	281	377	404

**General Notes**

Note 1 Following components are satisfied to use according to AS/NZS 1170.2 - 2011 Amdt 3 - 2013

Components	Part Number	Description
Standard Rail	ATL-TYN-28	Antai Rail II
Light Rail	ATL-TYN-53	Antai Rail III
Light Rail 2	CG-010	Antai CG-010 Light Rail
Inter Clamp	ATL-FWNY-09	Internal fixing between rail and Solar Panel
End Clamp	ALT-TYN-14	End fixing between rail and Solar Panel
Adjustable Tilt Leg	ATL-TYN-57	Adjustable back legs
Rail Splice	ATL-TYN-21	Rail Connection
Klamp Lock 406 Clip		Capacity from test report No.MT-15/317

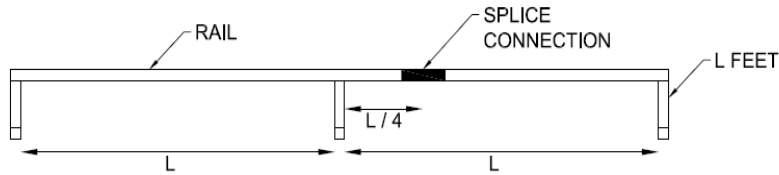
Note 2 Refer attached Gamcorp Roof Definition and Figure 5.3 of AS/NZS 1170.2:2011 for definition of roof zones

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Terrain Category 3 (TC3) refers to numerous closely spaced obstructions having heights generally from 3m to 10m. For example, suburban housing or light industrial estates. Refer clause 4.2.1 of AS/NZS 1170.2-2011 Amdt 3-2013 for definition of Terrain Category 3.

Note 4 Above tables apply when the roof sheeting is **Lysaght Kliplok 406** with minimum 0.42 BMT.

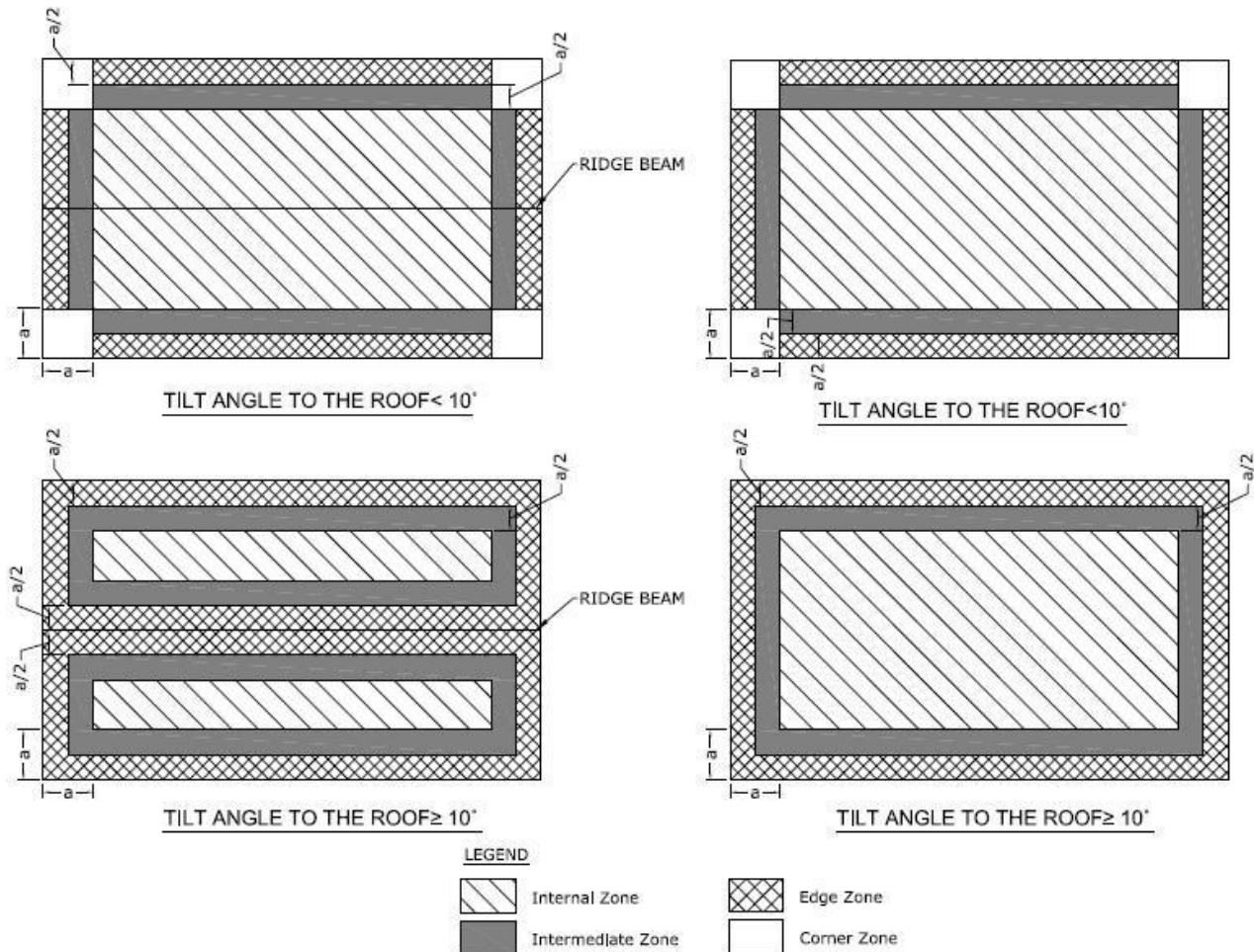
Note 5 Splice connection must placed quarter length of the spacing of the L foot. No Splice connection should be placed at the centre of spacing or over the L foot.



## For tilt array systems

Condition:

- a. For pitched roofs where roof angle is between  $1^\circ$  and  $45^\circ$ .



In the front figure  $h$  = height,  $b$  = width and  $d$  = length of the building.

Step 1: Determine building height, width and length.

Step 2: Multiply the width of the building by 0.2

Step 3: Multiply the length of the building by 0.2

Step 4: Determine **lowest** value between: (height of the building) **and**  $0.2 \times$  length of the building **and**  $0.2 \times$  width of the building

Step 5: The lowest value in step 4, equates to **a**.

